

HARVEST ALTERNATIVES

Annual harvest levels were derived using an IDL Planning Tool software package developed for the Idaho Department of Lands by Mason Bruce and Girard, Inc. (MB&G). This set of integrated software tools incorporated the agency's trust objectives of maintaining and improving the productive capacity of forest lands and maximizing long-term financial return.

The Department objectives for State endowment forest lands are to:

1. Manage forest resources to secure the maximum long-term financial return to the endowment trust institutions.
2. Provide the highest "long-term" sustainable harvest level while minimizing flow fluctuations; and,
3. Maintain and improve the capability of forestlands to produce marketable forest products in perpetuity while protecting water quality and beneficial uses.

The following broad management strategies will generally be followed in the process of pursuing these objectives:

1. Convert mature primary management base sawtimber stands into younger, faster growing stands;
2. Establish an even-age class distribution;
3. Ensure a perpetual flow of forest products; and,
4. Reduce growing stock levels in heavily stocked stands (timber types 43, 33, 23, and 13).

IDL Manager and Yield Table Tools

The IDL Manager software tool stratifies the CFI plot data into analysis units (timber types) and three site index classes (high, medium and low) for each analysis unit and also compiles the net volume for each analysis units. The Yield Table tool then derives yield tables for each analysis unit by site class based on the plot data and the associated harvest regimes.

Regeneration yield tables for determining yields for future natural and planted stands,

were also derived for each of the three site classes (Appendix F). These yield tables were used to determine the Area's Mean Annual Increment (MAI) and Periodic Annual Increment (PAI) by site class (Appendix F). The intersection of the MAI and PAI curve is considered the optimum biological harvest age in terms of maximizing net annual board foot production.

Desired Standing Volume

To maximize productivity and financial returns a desired standing volume (DSV) was calculated based on the assumptions that:

- There is a desired standing volume which, when equally distributed by acres over age classes, will achieve management objectives;
- The maximum age, and thus the rotation age for naturally regenerated stands, is the culmination of the MAI;
- The maximum age, and thus the rotation age for planted stands, is the age of maximum Present Net Value (PNV).
- A financial analysis on the cost and return for doing precommercial thins, showed a higher PNV, for precommercially thinned stands versus not doing precommercial thins. Because of the drier sites in southwestern Idaho, high and medium sites were commercially thinned once before final harvest. Current management practices, on the drier sites, include one and sometimes two commercial thins before final harvest. At a discount rate of 4%, the high sites showed a positive return and the medium and low sites showed a negative return. For medium sites that were precommercially thinned, a positive return was obtained using a discount rate of 3.8% and the stands that were not thinned showed a positive return using a discount rate of 3.2%. Medium sites that were also commercially thinned showed a positive return using a discount rate of 3.9%. For the low sites, the precommercially thinned stands showed a positive return using a discount rate of 2%. The low site stands without a precommercial thin showed a positive return using a discount rate of 1.4%. Because of the nature of the low sites in the Southwestern Idaho Supervisory Area, only 50% of the low sites were precommercially thinned.

Two levels of desired standing volume were computed:

1. All high and medium sites were regenerated naturally, precommercially thinned, and commercially thinned once and grown to their culmination point, while only half of the low sites were precommercially thinned (Nat-DSV).

2. All planted stands, approximately 30 acres per year, were precommercially thinned and grown to their maximum PNV. The high and medium natural stands were regenerated naturally, precommercially thinned, and commercially thinned once, and half of the low site stands which were precommercially thinned (Econ-DSV). Since the Southwestern Idaho Supervisory Area plants only 30 acres per year and the IDL Planner calculated that only 604 acres were in the high sites, only medium sites were planted. Since riparian zones normally are better sites, these riparian zones contain some of the high site acres. For these reasons, only medium sites were made available for planting for calculating the economic desired standing volume.

Using the first method the desired standing volume levels for the Southwestern Idaho Supervisory Areas, if all stands are regenerated naturally (Nat-DSV), is 402 MMBF (Table 7). The desired standing volume, where a portion of the medium sites are planted and the other sites regenerated naturally (Econ-DSV), is 397 MMBF

**Table 7. Desired Standing Volume
Southwestern Idaho Supervisory Area**

Nat-DSV	
Site Class	Total Volume (MMBF)
High	10
Medium	197
Low	196
Desired Standing Volume	
	402

Econ-DSV	
Site Class	Total Volume (MMBF)
High	10
Medium	191
Low	196
Desired Standing Volume	
	397

Once the desired standing volume is established, alternative harvest levels and

schedules can be determined. The harvest scheduling goal is to achieve a regulated forest and reduce the current standing volume to the desired standing volume. Stands were grown using the Windows version of the USFS's Spectrum (Version 2.01) harvest scheduling model, otherwise known as SpecWin.

Harvest Regimes

Spectrum is a linear programming model that optimizes an objective function to a set of constraints. The IDL's objective is to maximize the Present Net Value (PNV). For each harvest level, the model was run to optimize for maximum PNV.

Harvest regimes were developed for each analysis unit. Actual management activity is based on site specific conditions and may be different from the analysis regimes.

- Stumpage value was based on the Area's average stumpage value, by species, over the last ten years.
- Stands were commercially thinned based on stand site index class and age with a minimum removal of 3,000 board feet per acre.
- Final harvest regimes include shelterwood harvest for naturally regenerated stands (60 percent volume removal) and clearcut harvest (100 percent volume removal) for planted stands.